

AMENDMENTS TO THE CLAIMS

1. (Presently Amended) A radio frequency electronic filter comprising:
 - an input;
 - an output;
 - first and second resonators coupled to the input and the output;
 - the first resonator including a first voltage tunable dielectric varactor;
 - the second resonator including a second voltage tunable dielectric varactor, each of the first and second voltage tunable dielectric varactors comprising a tunable dielectric layer capable of being operated at room temperature, wherein each of the first and second voltage tunable varactors comprise a first electrode and a second electrode, wherein the tunable dielectric layer at least partially fills a gap defined between the second electrode and the first electrode, wherein the first and second resonators comprise:
 - a ceramic block defining at least two openings extending from a top surface of the ceramic block toward a bottom surface of the ceramic block.
2. (Original) The radio frequency filter according to claim 1, wherein one of the dielectric varactors is connected between each of the openings and an outside surface of the ceramic block.
3. (Original) The radio frequency filter according to claim 1, wherein the top surface of the ceramic block is partially metallized.
4. (Withdrawn) The radio frequency filter according to claim 2, further comprising:
 - a first electrode positioned a predetermined distance from a first one of the openings;
 - a second electrode positioned a predetermined distance from a second one of the openings;
 - a third dielectric varactor coupled between the first electrode and the first one of

the openings; and

a fourth dielectric varactor coupled between the second electrode and the second one of the openings

5. (Canceled) A radio frequency electronic filter comprising:

an input;

an output;

first and second resonators coupled to the input and the output;

the first resonator including a first voltage tunable dielectric varactor;

the second resonator including a second voltage tunable dielectric varactor, each of the first and second voltage tunable dielectric varactors comprising a tunable dielectric layer capable of being operated at room temperature, wherein the first and second resonators comprise:

a ceramic block defining at least two openings extending from a top surface of the ceramic block toward a bottom surface of the ceramic block

6. (Withdrawn) The radio frequency filter according to claim 4, wherein the second electrode may be a "T-type" electrode.

7. (Withdrawn) The radio frequency filter according to claim 4, further comprising a trapezoidal projection on the second electrode.

8. (Withdrawn) The radio frequency filter according to claim 4, wherein the varactor comprises a substrate and a first electrode positioned on a first portion of a surface of the substrate; and

a second electrode positioned on second portion of the surface of the substrate and separated from the first electrode to form a gap therebetween; and

wherein a tunable dielectric material may be positioned on the surface of the

substrate and in the gap between the first and second electrodes.

9. (Withdrawn) The radio frequency filter according to claim 8, wherein a section of the tunable dielectric material extends along a surface of the first electrode opposite the substrate and wherein the second electrode includes a projection that is positioned on a top surface of the tunable dielectric layer opposite the substrate forming a rectangular shape and extending along the top surface such that it vertically overlaps a portion of the first electrode.

10. (Previously Presented) The radio frequency filter according to claim 1, wherein the tunable dielectric layer may be a thin or thick film.

11. (Withdrawn) The radio frequency filter according to claim 4, further comprising a triangle-type projection on the second electrode.

12. (New) A radio frequency electronic filter comprising:

an input;

an output; and

a resonator electrically coupled to the input and the output, the resonator comprising a voltage tunable dielectric varactor comprising:

a substantially planar substrate layer;

a substantially planar first electrode comprising a first side and an opposing second side, the first side positioned parallel to and adjacent to a first portion of the substantially planar substrate layer;

a substantially planar projection of a tunable dielectric layer that is substantially parallel with and adjacent to the second side of the first electrode, the tunable dielectric layer electrically tunable at room temperature; and

a second electrode comprising a substantially planar projection that overlaps and is positioned substantially parallel to the first electrode, wherein the

second electrode is separated from the first electrode by the substantially planar projection of the tunable dielectric layer.

13. (New) The radio frequency filter according to claim 12, wherein the substantially planar projection of the second electrode is rectangular.

14. (New) The radio frequency filter according to claim 12, wherein the substantially planar projection of the second electrode is trapezoidal.

15. (New) The radio frequency filter according to claim 12, wherein the substantially planar projection of the second electrode is triangular.

16. (New) The radio frequency filter according to claim 12, wherein the substantially planar projection of the tunable dielectric layer is less than about five micrometers thick.

17. (New) The radio frequency filter according to claim 12, wherein the tunable dielectric layer has a dielectric constant of between 2 and 1000.

18. (New) The radio frequency filter according to claim 12, wherein the tunable dielectric layer comprises BSTO.

19. (New) The radio frequency filter according to claim 12, wherein the tunable dielectric layer comprises BSTO-CaTiO₃.

20. (New) The radio frequency filter according to claim 12, wherein the tunable dielectric layer comprises BSTO-MgTiO₃.

21. (New) The radio frequency filter according to claim 12, wherein the tunable dielectric

layer comprises BSTO-MgO.

22. (New) The radio frequency filter according to claim 12, wherein the tunable dielectric layer comprises BSTO-MgAl₂O₄.

23. (New) The radio frequency filter according to claim 12, wherein the tunable dielectric layer comprises BSTO-MgSrZrTiO₆.

24. (New) The radio frequency filter according to claim 12, wherein the tunable dielectric layer comprises PZT.

25. (New) The radio frequency filter according to claim 12, wherein the first tunable dielectric layer comprises PLZT.

26. (New) The radio frequency filter according to claim 12, wherein the first tunable dielectric layer comprises barium calcium zirconium titanate.

27. (New) The radio frequency filter according to claim 12, wherein the first tunable dielectric layer comprises KSrNbO₃.